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## **SEPTEMBER-NEWSLETTER-ELEVATOR DANGERS**

Each year, firefighters are brought up to fire floors in high-rise buildings by elevator and are forced to run for their lives through a gauntlet of flame, heat and smoke. Two firefighters in Memphis, Tennessee did not make it out alive. A firefighter in White Plains, New York was trapped and died inside an elevator during a fire. Last month one, possibly two, Russian firefighters were trapped and killed in an elevator while fighting a fire in a high rise tower containing a restaurant and observation deck.



Firefighters responding to fires in high-rise structures must realize the elevator is a deadly trap during fire. Regardless of whether the elevator is equipped with an emergency mode "firefighter service" or not. Firefighters must use extreme caution when using an elevator during a fire. Fire experience and testing has revealed flame, heat and water can cause elevators to malfunction.

#### **FDNY STUDY**

An eight-year study of 178 high-rise fires in New York City where elevators with Phase I and Phase II "firefighter service" were used revealed dire results:

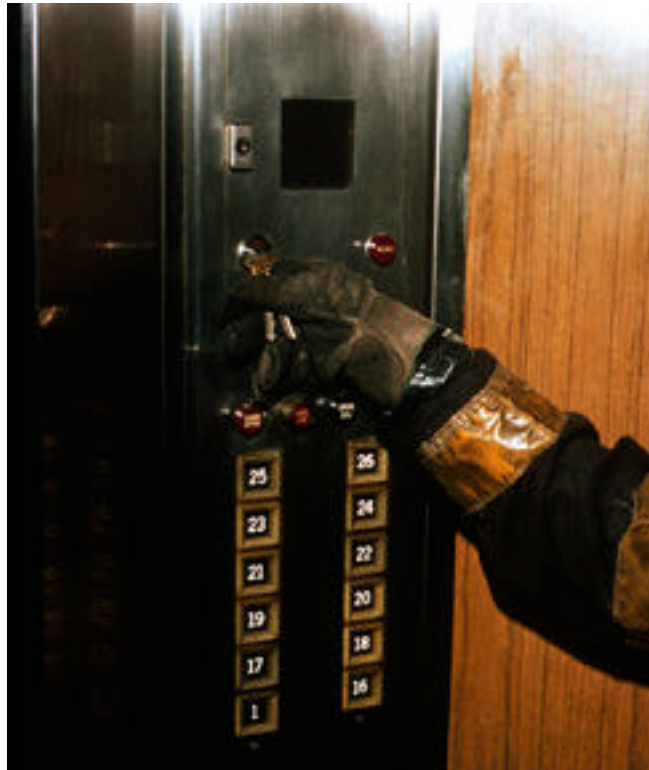
- 59 elevators failed either upon arrival of the firefighters or during the fire.
- . 37% of the 59 failures were the result of fire or water damage to the elevator electrical system.

Because of the unreliability of elevators during high rise fires, the FDNY has requested a Phase III elevator be installed in high-rise buildings in New York City.

#### **FIREFIGHTER ELEVATOR SERVICE**

**Phase I elevator** system is defined as the automatic or manual recall of elevators to the lobby of a high rise building. This Phase I system is designed to recall elevators and prevent building occupants from using them during a fire.

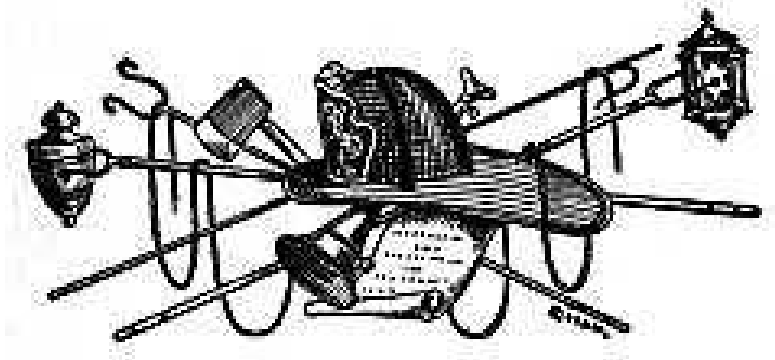
**Phase II elevator** is defined as a system that allows a firefighter to operate an elevator during a fire, from within the car in an emergency mode after the Phase I system has recalled them to the lobby.



**Phase III elevator** system, proposed by the FDNY, would be an elevator car located in a fire and smoke protected enclosure, with a wiring system insulated from the effects of water and fire.

### **ELEVATOR MALFUNCTION CAUSES**

The most dangerous elevator during a high-rise fire is one, which does not have a Phase II "firefighter service" mode. There are several ways an elevator that does not have an emergency "firefighter service" mode can malfunction and bring firefighters up to the fire floor and almost certain death. This elevator system malfunctioning can occur when a person on the fire floor escaping a fire pushes a corridor call button, then decides to leave by the stairs because the smoke and heat in the corridor become too severe.



Also a firefighter can be brought up to a fire floor in an elevator during a high-rise fire if the corridor (mechanical) call button and wiring becomes deformed, deteriorated and melted by the heat of a fire.

A third way elevators are called to a fire floor during a high-rise fire is when the electronic touch button (immovable, touch sensitive) is activated by exposure to dense smoke.

### **ELECTRONIC CALL BUTTONS**

**NOTE:** Electronic call buttons do not operate by heat from a person's finger. This is a misconception. Electronic call buttons are activated by the completion, through the person touching it, of a circuit to the ground. Dense smoke can create this circuit to the ground.

### **LOCATING A FIRE**

The following safety and survival tactics must be used when using an elevator during a high-rise fire even one with a Phase II "firefighter service" mode.

Accurately determine the location of the fire floor upon arrival. Be aware that a person reporting a fire from the 12th floor of a building may have seen smoke and flame outside the window rising up from the 11th, or 10th floor below.

Even when a building employee tells you the floor where the fire has been reported, check the exact floor from the alarm panel or video display terminal. The floor of fire listed on the alarm ticket and the floor shown on the alarm panel, and the floor of fire reported to you by the person in charge, must all be the same number. If they are not, or when several floors on the alarm panel indicate smoke detectors have activated, assume the lowest floor is the fire floor. Start your search here.



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Use the elevator that has a Phase II firefighter emergency mode and realize this system may fail. If the fire is located on the sixth floor or below, walk up the stairs instead of using the elevator.

Never let a building employee take you up to a fire in an elevator. At one fire, a building employee went up to investigate a fire after transmitting the alarm. He saw it was a small fire and returned to the lobby. As the fire company arrived he assured them it was a small fire and took them back up to the floor in the elevator. When the elevator car door opened, the lobby contained a roaring fire, The firefighters and screaming employee ran for their lives and fortunately escaped to the safety of a stair.

### **SAFETY OPERATING PROCEDURES**

Never take an elevator up to a floor where there is a reported fire or where a smoke or heat detector has been activated. Determine the lowest floor a fire. Then, take the elevator two or three floors below this floor. Leave a firefighter in the lobby to inform arriving companies and the chief of the reported fire floor, the elevator being use and the firefighters riding the elevator. After firefighters get off the elevator, they should walk up the stairs to the fire floor and send the elevator back down to the lobby with a firefighter operating the controls. Do not hold the elevator on an upper floor. Send the elevator down to the lobby to be ready for the hose team when the exact location of the fire has been determined.

At a high-rise building where there are elevator banks serving different portions of the building, for example an elevator bank serving floors 1 to 10 and another bank serving floors 11 to 20, consider using the elevators serving the lower floors and walking up to the fire. For example, if a fire is reported on the 14th floor, instead of taking the elevator serving floors 11 to 20 and stopping at the 12th floor and walking up two flights of stairs to the fire, take the lower bank of elevators serving I to 10. Get off at the 10th floor and

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walk up four flights to the fire. It is safer. There is no chance of the elevator malfunctioning and bringing you up to the fire.

Before entering an elevator, attempt to look up the shaft between the car door and hoistway door. You may see, hear or feel water from a sprinkler coming down the shaft. Also, there may be smoke in the car or shaftway. This would indicate a fire. Check the location of stairs in the lobby and their relation to the elevator. Look at the "You are here," sign near the elevator which shows the relationship of the elevator to the exit stairs; however, realize the lobby layout will differ from the upper floor layout, So stop the rising elevator car at an intermediate floor and check again where the stair enclosures are located in relation to your elevator. This also will insure the elevator controls work. Never take an elevator above an uncontrolled fire. Water may cause the electric cables to short circuit and stop the elevator in the shaft or cause it to rise uncontrollably above the fire. Even an elevator car in a blind shaft that has no opening to the fire floor can trap firefighters in an elevator. Master streams may collapse the elevator enclosure wall. Firefighters trapped in an elevator car above a fire could be asphyxiated in a chimney shaft.

When entering an elevator, all firefighters should wear full protective equipment with a mask ready for use. Forcible entry tools should be carried. If the elevator malfunctions, the tools may be needed to escape from the stalled car. A portable radio will be required to call for help. Trapped firefighters will have to hold the sliding car door closed manually for protection from heat and smoke. After closing the elevator car door, wedge wood chock between the closed car door and the car frame, or the sliding door will return to the open position, allowing fire and smoke to enter the elevator car where you are trapped.

A fire company entering an elevator to investigate a fire on an upper floor of a high-rise should have a portable radio. A firefighter assigned to operate an elevator in Phase II "firefighter service" mode should be equipped with a radio. If the elevator stalls or malfunctions in any way, the firefighter with the portable radio should immediately notify the officer in command of the fire. When using an elevator in Phase II going up to a fire, use the firefighter service control to stop the elevator at an intermediate floor.

Operate the control; see if the elevator stops as directed. This test ensures the Phase II mode is properly operating. If the elevator does not stop at the intermediate floor, this indicates the Phase II "firefighter service" mode is not functioning properly. Force the elevator to stop and get out and notify the incident commander. The elevator could be out of control and heading for the fire floor.

### **LESSONS LEARNED**

The fire service needs a Phase III elevator - one that can be used safely during a fire. A Phase I recall system and Phase II "firefighter service" mode are not dependable. Phase III elevators are recommended in the "Americans with Disabilities Act" for safe removal of disabled people during high-rise fires. The world's future high rise disasters will occur due to failure of the building systems preventing firefighters from performing their duties. This inability to fight a high rise fire will be due to one of the following: failure of the fire hose standpipe system; failure of the fire department portable radio system; and or failure of the phase I and or phase II elevator system.

## **Discussion Questions**

1. Identify the buildings in your community that have elevators
2. Do the elevators have phase I (recall) systems and or phase II (firefighter operating) system
3. Discuss how to operate a phase I and phase II elevator system
4. Discuss the cause of malfunctions of elevator systems trapping civilians.
5. Discuss any malfunction of elevator trapping firefighters. Did the malfunctioning elevator have a phase I or Phase II system?

# Test Questions

1. Which one of the following is most correct regarding elevator malfunction in the New York City study?
  - A. Water from hose streams or sprinkler discharge can cause malfunction
  - B. Fire damage to the call button can cause malfunction
  - C. A phase III type elevator is recommend for high rise buildings
  - D. All of the above are true

Answer\_\_\_\_\_

True or false

2. An eight years study of 178 high rise fires where elevators were used in phase I and phase II revealed the elevators failed 59 elevators failed upon arrival of the firefighters or during the fire.

Answer\_\_\_\_\_

True or false

3. A phase I elevator is defined as a system of automatic or manual recall of an elevator to the lobby of a high rise building.

Answer\_\_\_\_\_

True or false

4. A phase II elevator is defined as a system that allows firefighters to operate an elevator during a fire from within the car in an emergency mode after the phase I system has recalled them to the lobby

Answer\_\_\_\_\_

True or false

5. A phase III elevator is a system with an elevator car located in a fully enclosed fire and smoke protected enclosure with a wiring system insulated from the effects of fire water and heat during a fire.



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## Answers for Test Questions

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1. D
2. TRUE
3. TRUE
4. TRUE
5. TRUE